EXHIBIT A

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Johnson

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[54] **ELECTRONIC PROPOSAL PREPARATION SYSTEM**

[75] Inventor: **Jerome D. Johnson**, North Mankato, Minn.

[73] Assignee: **Clear With Computers, Inc.**, Mankato, Minn.

[*] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 5,493,490.

[21] Appl. No.: **596,575**

[22] Filed: **Feb. 5, 1996**

Related U.S. Application Data

[63] Continuation of Ser. No. 878,602, May 5, 1992, Pat. No. 5,493,490.

[51] **Int. Cl.⁶** G06F 153/00; G06F 17/30; G06F 17/60

[52] **U.S. Cl.** 395/227; 395/224; 395/229

[58] **Field of Search** .... 364/400 R, 401, 364/402, 403, 408, 419.19; 395/600

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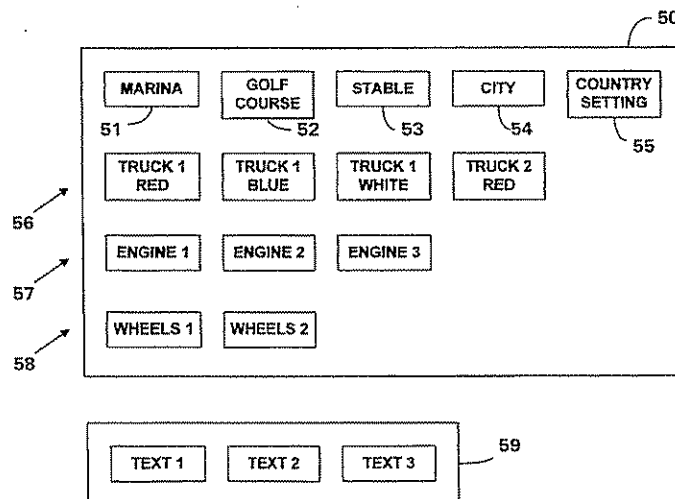#### OTHER PUBLICATIONS

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Primary Examiner—Robert A. Weinhardt
Assistant Examiner—Joseph Thomas
Attorney, Agent, or Firm—Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A.

[57] **ABSTRACT**

An electronic system for creating customized product proposals stores a plurality of pictures and text segments to be used as building blocks in creating the proposal. The pictures may include various products, environments in which the products may be used, and available product options. The text segments may include textual descriptions of the product, environments in which the product may be used, and its performance specifications. The system queries a user to determine a customer's needs and interests. Based upon the answers to the queries, the system selects the appropriate picture and text building blocks to fill in proposal templates. The system can print the completed proposal templates to provide the user with a customized, printed proposal that describes features and benefits of a product, in a particular environment, that are of interest to the customer who is to receive the proposal.

21 Claims, 43 Drawing Sheets

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FIG. 1A

FIG. 1B

FIG. 2

ACTIVE DATABASE   103

A CUSTOMIZEDATA
116

A CUSTOMIZEDATABASE
114

A PROPOSALDATA
112

A PROPOSAL
110

FIG. 3

FIG. 4

A TABLEOFCONTENTSDATA <u>130</u>

A PAGEDESCRIPTIONRECORD
<u>314</u>

FIG. 5

FIG. 6

FIG. 7

FIG. 8

— 105

STATIC DATABASE

ENVIRONMENT PICTURES — 122

ENVIRONMENT TEXT — 124

PRODUCT PICTURES — 126

PRODUCT TEXT — 128

PRODUCT SPECIFICATIONS — 121

PERFORMANCE SPECIFICATIONS — 123

PRICE SPECIFICATIONS — 125

TRADEMARK PICTURES — 127

LIFE CYCLE SPECIFICATIONS — 129

PRODUCT DESCRIPTIONS — 131

FIG. 9

104

PROCESSES AND GENERATES A CUSTOMIZED PRINTED PROPOSAL ⟋ 262

QUERIES ACTIVE DATABASE ⌐ 264

QUERIES STATIC DATABASE ⌐ 266

READS PAGE DESCRIPTION RECORDS ⌐ 268

READS PAGE LAYOUT IDENTIFIERS ⌐ 270

LOCATES AND RETRIEVES ACTIVE DATA ⌐ 272

LOCATES AND RETRIEVES STATIC DATA ⌐ 274

PLACES DATA IN FIELDS ON PAGES ⌐ 276

PRINTS IN PLURALITY OF COLORS ⌐ 278

DEALER PERSONALIZATION ⌐ 280

CUSTOMER PERSONALIZATION ⌐ 282

LINKS PAGE IDENTIFIERS WITH DATA ⌐ 285

QUERIES REPORT DATABASE ⌐ 265

QUERIES DIFFERENCE DATABASE ⌐ 267

FIG. 10

FIG. 11

┌ 170

MAIN MENU

FILE ─ 172
NEW PROPOSAL ─ 186
RECALL PROPOSAL ─ 188
SAVE PROPOSAL ─ 190

CUSTOMER INFORMATION ─ 176
CUSTOMER ─ 198
LETTER ─ 202
STD. & OPT. EQUIP. ─ 204
TRADE ─ 206
QUOTATION ─ 208
PAYMENT SCHED. & TERMS ─ 210
ECONOMICS ─ 212

CONTENTS ─ 174
TABLE OF CONTENTS ─ 196

CUSTOMIZE ─ 177
PASSWORDS ─ 224
DEALER NAME ─ 226
DEALER INFORMATION ─ 228
INTERNATIONAL ─ 234

PRINT ─ 178
PROPOSAL ─ 218

FIG. 12

174

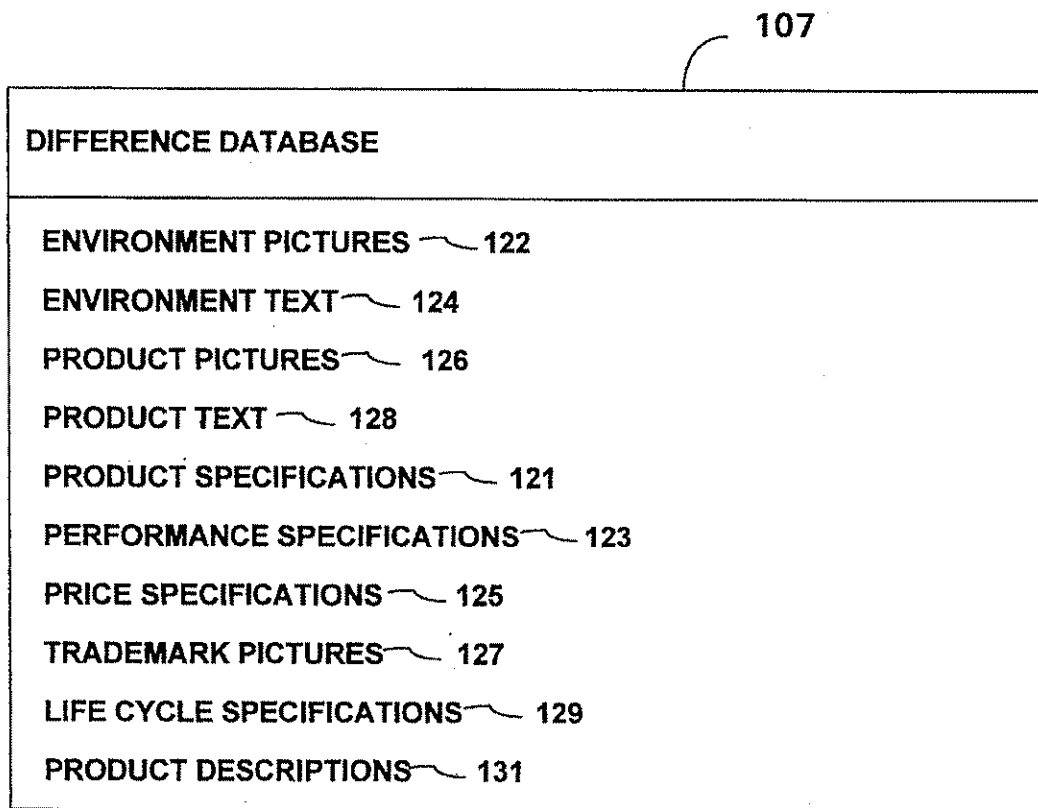| CONTENTS	
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 PRODUCT INFORMATION ⁓ 238
    FEATURES & BENEFITS ⁓ 256
    SPECIFICATIONS ⁓ 258
 PERFORMANCE ⁓ 240
 TRADE ⁓ 242
 QUOTATION & SIGNATURE ⁓ 244
 PAYMENT SCHED. & TERMS ⁓ 246
 ECONOMICS ⁓ 248	

FIG. 13

107

DIFFERENCE DATABASE
ENVIRONMENT PICTURES ～ 122
ENVIRONMENT TEXT ～ 124
PRODUCT PICTURES ～ 126
PRODUCT TEXT ～ 128
PRODUCT SPECIFICATIONS ～ 121
PERFORMANCE SPECIFICATIONS ～ 123
PRICE SPECIFICATIONS ～ 125
TRADEMARK PICTURES ～ 127
LIFE CYCLE SPECIFICATIONS ～ 129
PRODUCT DESCRIPTIONS ～ 131

FIG. 14

106

REPORT DATABASE
PAGE LAYOUTS 〜 120

FIG. 15

USER INTERFACE
FORM OBJECTS

A LETTERFORM
288

A FINANCEFORM
296

A LIFECYCLEFORM
298

A TABLEOFCONTENTSFORM
284

A PASSWORDFORM
300

A PRODUCTFORM
290

A LISTOFSALESPERSONSFORM
310

A DEALERFORM
302

A RECALLPROPOSALFORM
306

A TRADEFORM
292

A SAVEPROPOSALFORM
308

A LANGUAGEFORM
304

A QUOTATIONFORM
294

A CUSTOMERFORM
286

FIG. 16

ACTIVE DATABASE
DATA OBJECTS

A LANGUAGEDATA
160

A CUSTOMIZEDATABASE
114

A LISTOFSALESPERSONDATA
158

A PASSWORDDATA
164

A DEALERDATA
156

A PROPOSAL   110

A PRODUCTDATA
140

A TRADEDATA
142

A QUOTATIONDATA
144

A TABLEOFCONTENTSDATA
130

A FINANCEDATA
146

A COVERSHEETDATA
132

A SALESPERSONDATA
134

A LETTERDATA
138

A CUSTOMERDATA
136

A LIFECYCLEDATA
148

FIG. 17

FIG. 18

FIG. 19

FIG. 20

PRINTER

21 - 4

THE REPORT GENERATOR
104

21 - 2

21 - 3

21 - 1

THE ACTIVE
DATABASE
103

THE PROPOSAL
110

THE CUSTOMERDATA
136

THE REPORT DATABASE
106

A PAGE LAYOUT
120

FIG. 21

```
                            ┌──────────────────┐
                            │      USER        │
                            └──────────────────┘
                                     │
                          22 - 1     │
                                     ▼
                    ⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒
                   (      THE PASSWORDFORM       )
                    (           300             )
                    ⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒⌒
        22 - 6          │           │       101         │
                22 - 5  │    22 - 2 │  ╱              22 - 3
           │       │    │           ▼ │                 │
           │       │    │    ┌──────────────────┐       │
           │       │    │    │ SELECTION DEVICE  │       │
           │       │    │    └──────────────────┘       │
           │       │    │        │          │           │
           │       │    │   22-4 │    22-2  │           │
           ▼       ▼    │        ▼          ▼           ▼
```

THE SALESPERSONDATA
134

A LISTOFSALESPERSONS
310

THE PROPOSAL   110

THE CUSTOMIZEDATABASE
114

FIG. 22

FIG. 23

FIG. 24

FIG. 25

FIG. 26

FIG. 27

FIG. 28

FIG. 29

FIG. 30

FIG. 31

FIG. 32

FIG. 33

FIG. 34

FIG. 35

FIG. 36

FIG. 37

FIG. 38

FIG. 39

FIG. 40

FIG. 41

FIG. 42

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ELECTRONIC PROPOSAL PREPARATION SYSTEM

This is a Continuation of application Ser. No. 07/878,
602, filed May 5, 1992, now U.S. Pat. No. 5,493,490, which
application are incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to a system for creating a
customized proposal by linking together product pictures,
environment pictures showing environments in which the
product may be used, and text related to the product. The
system includes means for linking together predetermined
product pictures, environment pictures, and text based upon
a potential customer's answers to predetermined queries.

BACKGROUND AND SUMMARY OF THE INVENTION

Many products, such as cars, are illustrated to customers
by preprinted brochures. Car dealerships, for example, have
glossy brochures that show pictures of cars and generic
textual descriptions of the cars. A customer may test drive
and actually inspect a particular car of interest. The dealer-
ship will also furnish the customer with one of the preprinted
brochures of the car. The brochure documents and contains
information about the car. The customer may refer to the
brochure and potentially be quite influenced by it in making
a decision regarding whether to purchase the car.

The generic nature of these preprinted brochures, how-
ever, may have a negative impact on the customer's ultimate
decision of whether to purchase and thus are often not
persuasive. Traditionally, only one brochure is available for
each car, for example, and every potential purchaser of that
car receives the same brochure. These brochures contain
glossy photographs of the car in a variety of settings, which
may include, for example, a country setting, city environ-
ment, golf course, and marina. Next to the photographs, the
brochures usually contain generic textual descriptions of the
car or potential uses of the car. Finally, the brochures
typically contain standard lists of options for the car along
with complex pricing charts from which one may calculate
a price based on a matrix of options and prices.

The preprinted brochures contain all of these different
settings for the car and generic information in an attempt to
appeal to any potential purchaser. For example, one cus-
tomer may enjoy golfing, and the brochure contains a
photograph of the car at a golf course to appeal to that
customer and influence that customer in his or her decision
to purchase the car. Another customer may want to use the
car to take long trips which pass through the country, and the
photograph in the brochure of the car in a country setting is
designed to appeal to that customer.

The brochures also contain standard pricing charts. Since
every brochure is generic to any customer, however, it must
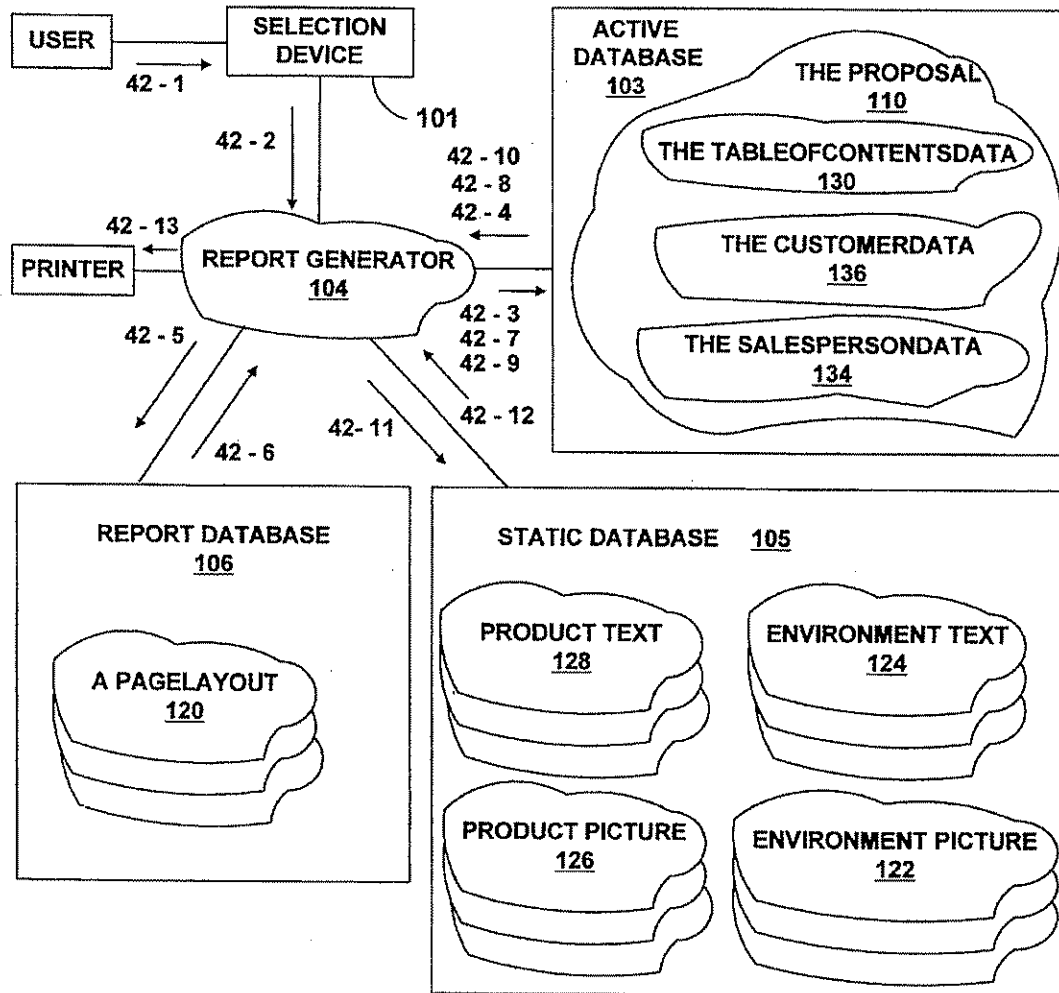contain complex pricing charts that include a matrix of
options and prices. Furthermore, since prices of the car or
options often change, the information in the brochure can
easily be out of date. Also, much of the pricing information
is not of interest to a particular customer, since the customer
will typically be interested in the price for a single, or
relatively few, combinations of options for the car.

In containing all of this varied and generic information in
an attempt to be "all things to every customer," the pre-
printed brochures actually are of limited value to any
particular customer. The brochures are not customer specific

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and, therefore, are not particularly appealing or persuasive
for any customer. The typical brochure contains much
information that is of no value or interest to a particular
customer due to the varied and generic nature of the product
pictures and textual descriptions. Furthermore, these pre-
printed brochures are expensive to produce because of the
glossy photographs and may be quickly out of date, meaning
that either a dealership must discard the brochures or pro-
vide customers with "old" brochures.

The present invention solves these problems by utilizing
a computer-based system to dynamically create customized,
printed proposals for potential purchasers of a product. The
system queries a customer to determine his or her interests
and desired options. The interests may include a "use"
desired by the customer, such as a marina or golf course. The
interests may also include the type of information, such as
technical, that the customer would like in the proposal. The
desired options may include the various features of interest
to the customer, such as the type of engine desired.

Based upon the customer's answers to the queries, the
system links product pictures, environment pictures, and
textual descriptions together in a customized proposal. The
system also has the capability to link together other aspects
in the proposal, which may include environment text
describing the product in a particular setting or environment.
The customized proposal, therefore, contains pictures, tex-
tual descriptions, and pricing information that is all of
interest to and relevant to a specific customer, since all of the
pictures and text were linked together based upon the
customer's answers.

Since each proposal is customized for a particular cus-
tomer, each proposal will have a much more persuasive
effect in selling the product. Also, if any information about
the product changes, such as prices of options, the system
information stored in a data base may be simply changed in
order to accommodate the new information. Additional
textual descriptions or pictures may also be added to the
system data base to be used in linking together information
for a proposal.

The quality of the pictures produced in these customized,
printed proposals can be made comparable in quality to the
glossy photographs in prior art proposals due to recent
advances in computer printers. Printers such as the Canon
CLC-300 produce color computer print-outs that resemble
color photographs. These customized proposals, therefore,
need not be inferior to prior art proposals in terms of the
quality of available pictures for the proposals.

This system for producing customized, high-quality pro-
posals has many potential applications, such as in the car
industry. A customized proposal generated by the present
invention will have a great appeal to each individual cus-
tomer and will be an asset in selling the product.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a block diagram illustrating conceptually
picture and text databases of the computerized proposal
system.

FIG. 1B is a diagram illustrating conceptually an elec-
tronic proposal template of the computerized proposal sys-
tem.

FIG. 2 is a block diagram showing the preferred system.

FIG. 3 is an object diagram showing an active database.

FIG. 4 is a class diagram showing a detailed depiction of
the classes in a preferred proposal data class.

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FIG. **5** is an object diagram showing a detailed depiction of a preferred table of contents object.

FIG. **6** is a class diagram showing a detailed depiction of the classes in a preferred customize data class.

FIG. **7** is an object diagram showing a user interface.

FIG. **8** is a class diagram showing a detailed depiction of the classes in a preferred form class.

FIG. **9** is a block diagram showing the contents of a static database.

FIG. **10** is a block diagram showing a detailed depiction of the elements in a preferred report generator.

FIG. **11** is a block diagram showing a detailed depiction of the elements in a preferred selection device.

FIG. **12** is a detailed depiction of the elements in a preferred main menu.

FIG. **13** is a detailed depiction of the elements within the "Contents" selection of the preferred main menu.

FIG. **14** is a block diagram showing the contents of a difference database.

FIG. **15** is a block diagram showing the contents of a report database.

FIG. **16** is an object diagram showing a detailed depiction of the elements in a preferred user interface.

FIG. **17** is an object diagram showing a detailed depiction of the elements in an active database.

FIG. **18** is an object diagram illustrating a preferred flow of control involved when selecting pages to print.

FIG. **19** is an object diagram illustrating a preferred flow of control involved when generating a cover sheet.

FIG. **20** is an object diagram illustrating a preferred flow of control involved when entering customer identification data.

FIG. **21** is an object diagram illustrating a preferred flow of control involved when generating customer identification data.

FIG. **22** is an object diagram illustrating a preferred flow of control involved when entering salesperson identification data.

FIG. **23** is an object diagram illustrating a preferred flow of control involved when generating salesperson identification data.

FIG. **24** is an object diagram illustrating a preferred flow of control involved when entering letter information.

FIG. **25** is an object diagram illustrating a preferred flow of control involved when generating a personalized letter.

FIG. **26** is an object diagram illustrating a preferred flow of control involved when selecting product descriptions.

FIG. **27** is an object diagram illustrating a preferred flow of control involved when generating product description pages.

FIG. **28** is an object diagram illustrating a preferred flow of control involved when entering product specification information.

FIG. **29** is an object diagram illustrating a preferred flow of control involved when generating product specification pages.

FIG. **30** is an object diagram illustrating a preferred flow of control involved when generating performance specification pages.

FIG. **31** is an object diagram illustrating a preferred flow of control involved when entering trade-in product information.

FIG. **32** is an object diagram illustrating a preferred flow of control involved when generating trade-in product pages.

FIG. **33** is an object diagram illustrating a preferred flow of control involved when entering product price quotation information.

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FIG. **34** is an object diagram illustrating a preferred flow of control involved when generating product price quotation pages.

FIG. **35** is an object diagram illustrating a preferred flow of control involved when entering product financing information.

FIG. **36** is an object diagram illustrating a preferred flow of control involved when entering product financing pages.

FIG. **37** is an object diagram illustrating a preferred flow of control involved when entering life cycle cost information.

FIG. **38** is an object diagram illustrating a preferred flow of control involved when generating life cycle cost pages.

FIG. **39** is an object diagram illustrating a preferred flow of control involved when generating a table of contents page.

FIG. **40** is an object diagram illustrating a preferred flow of control involved when printing a trademark.

FIG. **41** is an object diagram illustrating a preferred flow of control involved when choosing a language.

FIG. **42** is an object diagram illustrating a preferred flow of control involved when generating a signature page.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present computer system is preferably implemented using Object Oriented Design (OOD). Because OOD is a fairly new programming method, a brief explanation of OOD design concepts will be offered here in order to ensure a better understanding. The resource used for preparing this explanation is: Grady Booch, Object Oriented Design with Applications (1991) (published by The Benjamin/Cummings Publishing Company, Inc.).

According to Booch, the Object Oriented Design methodology views the "world" as a set of autonomous agents that collaborate to perform higher level behavior. The OOD agents are called objects. Objects can have a state, behavior and identity. A set of objects that share a common structure and common behavior are called a class. A set of objects working together to provide a behavior that satisfies some requirement of a problem is called a mechanism.

The design described herein is an object-oriented design. This design is described using object diagrams which show the interaction of the objects that make up the application. In addition, class diagrams are used to present the architecture of the system.

Unless otherwise stated, all classes making up the architecture of the system preferably are derived from a common base class named CWCObject. Where this is not the case, class diagrams are used.

INTRODUCTION

FIGS. **1A** and **1B** illustrate conceptually a primary feature of the computerized proposal system. The system allows a user to dynamically customize and create a proposal for individual customers. The customized proposal may contain specific items for a particular customer, depending upon the customer's needs and desires. FIG. **1A** shows conceptually a database **50** that electronically stores a plurality of pictures. The pictures may include environment pictures **51–55**, product pictures **56**, and pictures for various parts **57** and **58**. A textual descriptions database **59** may store a plurality of text segments that correspond to various pictures in the picture database **50**.

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FIG. 1B illustrates conceptually an electronic template for creating a page in a customized proposal. The system may query a user to determine a particular customer's needs and interests. Based upon the answers to the queries, the system may "fill in" the template 60 to customize a proposal for the customer. For example, if the customer has an interest in sailing or boating, the system may choose a picture of a marina environment 51 to use as the background or environment 62 in picture 61 of template 60. Likewise, if the customer has an interest in golfing, the system may choose a golf course environment 52. Within the environment 62, the system places a product 63 by selecting one of the plurality of product picture 56 based upon the customer's answers.

Each product 63 typically has several options available to the customer, such as the type of engine and wheels. Based upon the customer's answers, which indicate the customer's desired options, the system may select parts from the picture database 50 for parts 64 and 65 on product 63 in the template. The system may also select one of the plurality of text segments 59 to fill in text frame 66. The text in the text frame 66 would typically correspond to picture 61 and, for example, provide a description of the product or its performance specifications.

Accordingly, the system uses the stored pictures in the picture database 50 as building blocks for filling in the template. The system establishes a customer profile based on the customer's answers to queries. The system then uses the profile to "build" the empty frames, such as picture 61, in template 60.

The approach of using picture building blocks provides for much versatility and the capability to customize a proposal. Products may be shown in any one of a variety of environments by simply selecting the appropriate picture building blocks. Likewise, any combination of options may be shown on a particular product by selecting the appropriate part picture building blocks. Each combination of pictures for a finished template need not be pre-stored, since the system dynamically builds a template. Also, the system provides further advantages by allowing easy change of options. For example, if a particular type of wheel is no longer available on a truck, a user may simply change the stored picture for that wheel. Options may easily be changed by loading and storing new part pictures in the picture database. The system, therefore, provides for customized proposals that are up-to-date and may accommodate changes in available options. For simplicity, the system has been conceptually shown with a product in an environment. One skilled in the art will recognize that the system is capable of creating different types of templates or proposals based on different picture building blocks or different combinations of the building blocks.

OVERVIEW

Referring now to FIG. 2, a computer system 100 is shown. Preferred computer system 100 incorporates an active database 103, a static database 105, a report database 106, a user interface 102, a selection device 101, and a report generator 104. The computer system 100 may also incorporate a difference database 107. The selection device 101 is operatively interconnected to the active database 103, to the report database 106, to the report generator 104, and to the user interface 102. The active database 103, the report database 106, the static database 105, and the difference database 107 are operatively interconnected to the report generator 104.

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Referring now to FIG. 2 in combination with FIG. 3 and FIG. 4, the active database 103 may electronically store proposal-related customer information in the proposal object 110. A proposal object 110 is an instance of the proposal class which is itself derived from the CWCObject class. The active database 103 may contain a plurality of proposal objects 110. Each proposal object 110 may contain a plurality of ProposalData objects 112. The ProposalData objects 112 may store customer-related information collected by the user. ProposalData objects 112 are instances of the ProposalData class 320 which is derived from the CWCObject class. Customer-related information may be entered interactively via the user interface 102 typically beginning at the time the program is first started, and may continue to be entered intermittently throughout the time the program is running. Referring now to FIG. 7, in combination with FIG. 3, FIG. 16, and FIG. 17, the user-entered information may be gathered on one or more of the various Form objects 118, and then stored in one or more of the various ProposalData objects 112 in the proposal 110 in the active database 103.

Table 1 shows how information is stored in a preferred embodiment: the first column indicates the type of information stored; the second column indicates the corresponding object by which a user may enter the information; the third column indicates the corresponding class of which the object is an instance; and the fourth column indicates the corresponding form class from which the class in the third column is derived. The classes are identified in the table by reference numerals and preferably have the same identifying label as the objects to which they correspond. For example, reference numeral 361 in table 1 refers to the TradeForm class 361.

TABLE 1

Type of Information	Object	Class	Form Class
trade-in product	TradeForm Object 292	361	340
product price quotation	QuotationForm object 294	362	340
financing a product	FinanceForm object 296	364	340
product life cycle cost	LifeCycleForm object 298	366	340
personalized letter	LetterForm object 288	358	340
product	ProductForm object 290	360	340
customer	CustomerForm object 286	356	340
table of contents	TableOfContentsForm object 284	354	340
salesperson	ListOfSalesPersonsForm object 310	352	340
to save a proposal	SaveProposalForm object 308	350	340
to recall a stored proposal	RecallProposalForm object 306	348	340
language	LanguageForm object 304	346	340
dealer	DealerForm object 302	344	340
password	PasswordForm object 300	342	340

Objects of classes derived from a common base class can be referred to as if they were objects of the common base class due to the principle of polymorphism. The TradeForm object 292 can therefore be treated generically as a Form object 118. The user interface 102 typically comprises a collection of such Form objects 118, each of which can be made to load itself into a window on the computer screen.

Table 2 shows how information gathered by the various objects described above may be stored as data objects in a preferred embodiment: the first column indicates the type of information stored; the second column indicates the corresponding data object in which the information may be